

Press release

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Basic information

Name: Sarah Christine Christensen

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Department of: Biomedicine

Main supervisor: Morten S. Nielsen

Title of dissertation: "Characterization of antibodies for receptor-mediated drug delivery across the blood-brain barrier"

Date for defence: May 12, 2020 at (time of day): 13.00 Place: Grundet COVID-19 vil forsvaret blive gennemført online.

Press release (Danish)

Karakterisering af antistoffer til receptor-medieret levering af medicin over blod-hjernebarrieren

Leveringen af terapeutiske antistoffer til hjernen efter intravenøs administration kompliceres af tilstedeværelsen af blod-hjerne-barrieren, som ofte hindrer en vellykket behandling af hjernesygdomme med antistofbaserede lægemidler. Hjerne-endotelceller, der udgør det morfologiske grundlag for blod-hjerne-barrieren, er tæt forbundet med proteinkomplekser, såkaldte tight junctions, som medvirker til en lav paracellulær passage af antistoffer. Forskellige lægemiddelleveringsstrategier er blevet testet, og særligt bindingen af lægemidler til blod-hjerne-barrieren-receptorer, der er involveret i transport af molekyler over blod-hjerne-barrieren, er en af de mest studerede fremgangsmåder.

Dette ph.d.-projekt var centreret omkring to receptorer, der for nylig er foreslåede for transport over blod-hjerne-barrieren; basigin og CD320. Disse receptorer har en høj genekspression i hjerne-endotelceller sammenlignet med lever- og lungeendotelceller, hvilket gør dem til potentielle kandidater til lægemiddellevering over blod-hjerne-barrieren.

Samlet set giver karakterisering af basigin-antistofferne og deres intracellulære sortering værdifuld viden inden for basigin-medieret lægemiddellevering til hjernen. Desuden kan resultaterne fra CD320-ekspressionsstudier inspirere til fremtidig anvendelse af CD320-receptoren som et nyt potentielt mål for receptor-medieret transport over blod-hjerne-barrieren for i sidste ende at forbedre behandlingen af hjernesygdomme. Resultaterne beskrives i et nyt ph.d.-projekt fra Aarhus Universitet, Health. Projektet er gennemført af Sarah Christine Christensen, der forsvare det d. 12/5 2020.

Forsvaret af ph.d.-projektet er offentligt og finder sted den 12/5 kl. 13. Grundet COVID-19 vil forsvaret blive gennemført online. For at deltage i forsvaret, venligst kontakt Sarah Christine Christensen på scc@biomed.au.dk senest den 11/5.

Titlen på projektet er "Karakterisering af antistoffer til receptor-medieret levering af medicin over blod-hjernebarrieren". Yderligere oplysninger: Ph.d.-studerende Sarah Christine Christensen, e-mail: scc@biomed.au.dk, tlf. +45 22766301.

Bedømmelsesudvalg:

Professor Steffen Thiel (chairman)

Department of Biomedicine, Aarhus University, Aarhus C, Denmark

Group Leader Stefan Liebner, PhD
Institute of Neurology (Edinger-Institute) University Hospital, Goethe University Frankfurt am Main,
Germany

Director Per-Ola Freskgård, PhD
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Press release (English)

Characterization of antibodies for receptor-mediated drug delivery across the blood-brain barrier

The systemic delivery of therapeutic antibodies to the brain is complicated by the presence of the blood-brain barrier, thereby hampering successful antibody-based treatment of brain diseases. The brain endothelial cells, which constitute the morphological basis of the blood-brain barrier, are tightly connected by junctional protein complexes resulting in a low paracellular passage of antibodies. Different drug delivery strategies have been studied, but the most widely investigated approach is to target the receptors that normally are responsible for transport of essential molecules across the blood-brain barrier.

This PhD project was centered around two newly suggested receptors for transvascular delivery – basigin and CD320, as these have a high gene expression in brain endothelial cells compared with liver and lung endothelial cells, making them potential target candidates for drug delivery across the blood-brain barrier.

Collectively, characterization of the basigin antibodies and their intracellular trafficking provide valuable knowledge to the field of basigin-mediated drug delivery to the brain. Furthermore, CD320 expression results may inspire the future use of the CD320 receptor as a new potential target for receptor-mediated transport across the blood-brain barrier to ultimately improve treatment of brain disorders. The project was carried out by Sarah Christine Christensen, who is defending her dissertation on 12/5 2020.

The defence is public and takes place on 12/5 at 1 pm. Due to COVID-19, the defence will be held online. To gain access to the defence, please contact Sarah Christine Christensen on scc@biomed.au.dk at the latest on 11/5.

The title of the project is "Characterization of antibodies for receptor-mediated drug delivery across the blood-brain barrier". For more information, please contact PhD student Sarah Christine Christensen, email: scc@biomed.au.dk, Phone +45 22766301.

Assessment committee:

Professor Steffen Thiel (chairman)
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Germany

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